

WHAT IS CLAIMED IS:

1. A method of dissipating power to store heat in a heating element of a temperature controlling device, and then releasing the stored heat to warm air for evaporating a composition containing a pharmaceutically active formulation, said method comprising the steps of:

supplying power from a portable power source to a heating element, said device having a long thermal time constant in still air of greater than about 10 seconds;

storing heat in the heating element as power is supplied from the portable power source;

determining when the heating element achieves a predetermined operating temperature;

and

flowing air over the heating element after the heating element has achieved the predetermined operating temperature, to release heat to the flowing air, whereby a thermal constant of said device for releasing heat to the flowing air is less than about 5 seconds.

2. The method of claim 1, wherein said thermal time constant in still air is greater than about 15 seconds.

3. The method of claim 1, wherein said thermal time constant in moving air is about 3.5 seconds.

4. The method of claim 1, wherein said flowing air is driven by inhalation by a user on a channel fluidly connected with the heating element.

5. The method of claim 1, wherein the portable power source comprises at least one battery and said supplying power comprises flowing electrical energy through the heating element.

6. A method of improving the efficiency of a device for dissipating power to store heat in a heating element, storing heat in the heating element, and then releasing the stored heat to warm

air passing thereby, the warmed air being provided to pharmaceutically active formulation, said method comprising the steps of:

modifying the device to increase the thermal time constant of the heating element in still air.

7. The method of claim 6, wherein said modifying to increase the thermal time constant in still air comprises coating the thermal element with gold.

8. The method of claim 6, wherein said modifying comprises providing a shield around the heating element to absorb some heat that is lost from the heating element during storing of heat, wherein the shield functions as a secondary heat storage element that can subsequently release heat for warming the air passing thereby during an air warming operation.

9. The method of claim 8, wherein said modifying further comprises providing at least one shield closing element in an open end of said shield.

10. A method of improving the efficiency of a device for dissipating power to store heat in a heating element, storing heat in the heating element, and then releasing the stored heat to warm air applied to a pharmaceutically active formulation, said method comprising the steps of:
modifying the device to decrease the thermal time constant of the device in moving air.

11. A method of improving the efficiency of a device for dissipating power to store heat in a heating element, storing heat in the heating element, and then releasing the stored heat to warm air passing thereby, the warmed air to be applied to a pharmaceutically active formulation, said method comprising the steps of:

modifying the device to increase the thermal time constant of the device in still air; and

modifying the device to decrease the thermal time constant of the device in moving air.

12. A hand-held, portable air temperature controlling device, comprising:
a heating element adapted to receive energy from a self-contained, portable power source and store said energy as heat during a preheat operation; and

a housing surrounding said heating element and defining an air flow path through which air flows over said heating element to transfer heat to the air during an air warming operation;

wherein a thermal time constant of said device in still air during said preheat operation is greater than about 15 seconds and a thermal time constant of said device element in moving air during said air warming operation is less than about 15 seconds.

13. The air temperature controlling device of claim 12, wherein said heating element comprises a gold coated electrically resistive material.

14. The air temperature controlling device of claim 12, wherein said heating element comprises a shape that enhances heat dissipation in moving air.

15. The air temperature controlling device of claim 12, wherein said heating element comprises a thin, electrically resistive ribbon.

16. The air temperature controlling device of claim 12, further comprising a shield substantially surrounding said heating element, said shield being open at opposite ends to allow air to pass therethrough.

17. The air temperature controlling device of claim 16, wherein at least one of said heating element and said shield is gold coated.

18. The air temperature controlling device of claim 16, further comprising at least one shield closing element mounted in one of said open opposite ends.

19. The air temperature controlling device of claim 18, wherein at least one of said heating element, said shield and said at least one shield closing element is gold coated.

20. The air temperature controlling device of claim 12, further comprising a passive element downstream of said heating element, wherein said passive element conditions a heat

pulse generated when air flows over said heating element to transfer heat to the air during said air warming operation.

21. The air temperature controlling device of claim 12, further comprising a shield contained in said housing adjacent said heating element.

22. The air temperature controlling device of claim 12, further comprising a self-contained, portable power source adapted to connect with said heating element to supply said power thereto.

23. The air temperature controlling device of claim 22, wherein said power source comprises at least one battery.

24. The air temperature controlling device of claim 12, wherein said thermal time constant of said heating element in still air during said preheat operation is greater than about 20 seconds and said thermal time constant of said heating element in moving air during said warming operation is less than about 7 seconds.

25. The air temperature controlling device of claim 24, wherein said thermal time constant of said heating element in still air during said preheat operation is greater than about 30 seconds.

26. The air temperature controlling device of claim 25, wherein said thermal time constant of said heating element in still air during said preheat operation is greater than about 40 seconds and said thermal time constant of said heating element in moving air during said warming operation is less than about 5 seconds.

27. A hand-held, portable air temperature controlling device, comprising:
a heating element adapted to receive energy from a self-contained, portable power source and store said energy as heat during a preheat operation; and

a housing surrounding said heating element and defining an air flow path through which air flows over said heating element to transfer heat to the air during an air warming operation;

wherein said heating element comprises a thin, electrically resistive ribbon and said device has a thermal time constant in still air during said preheat operation which is greater than about 10 seconds and a thermal time constant in moving air during said warming operation which is less than about 5 seconds.

28. The air temperature controlling device of claim 27, wherein said resistive ribbon is constructed of two banks and each said bank is configured into a series of narrow channels.

29. The air temperature controlling device of claim 27, wherein said resistive ribbon is configured into a series of narrow channels.

30. The air temperature controlling device of claim 29, further comprising a shield substantially surrounding said resistive ribbon, said shield having open opposite ends to allow air to pass therethrough.

31. The air temperature controlling device of claim 30, further comprising a shield closing element fitted in at least one of said open opposite ends.

32. The air temperature controlling device of claim 31, wherein each of said open opposite ends has a shield closing element fitted therein.

33. The air temperature controlling device of claim 31, wherein each said shield closing element comprises a mesh element.

34. A hand-held, portable air temperature controlling device, comprising:
a heating element adapted to receive energy from a self-contained, portable power source and store said energy as heat during a preheat operation, said heating element comprising a thin, electrically resistive ribbon corrugated to form gaps to channel air therethrough; and

a housing surrounding said heating element and, together with said gaps in said ribbon, defining an air flow path through which air flows over said heating element to transfer heat to the air during an air warming operation.

35. The air temperature controlling device of claim 34, wherein said resistive ribbon comprises a plurality of banks and each said bank is configured into a series of narrow channels forming said gaps.

36. The air temperature controlling device of claim 35, wherein said resistive ribbon is constructed of two of said banks.

37. The air temperature controlling device of claim 34, further comprising a shield substantially surrounding said resistive ribbon, said shield having open opposite ends to allow air to pass therethrough.

38. The air temperature controlling device of claim 37, further comprising a shield closing element fitted in at least one of said open opposite ends.

39. The air temperature controlling device of claim 38, wherein each of said open opposite ends has a shield closing element fitted therein.

40. The air temperature controlling device of claim 38, wherein each said shield closing element comprises a mesh element.

41. The air temperature controlling device of claim 38, further comprising a passive element downstream of said resistive ribbon, wherein said passive element conditions a heat pulse generated when air flows over said heating element to transfer heat to the air during said air warming operation.

42. An electrically resistive ribbon for use in a hand-held, portable air temperature controlling device, said ribbon having a mass of about 0.05 to 5.0 grams and a surface area of about 25 to 60 cm².

43. The electrically resistive ribbon of claim 42, wherein said ribbon is corrugated to form gaps to channel air therethrough.

44. The electrically resistive ribbon of claim 42, wherein said resistive ribbon is constructed of two banks and each said bank is configured into a series of narrow channels.

45. The electrically resistive ribbon of claim 42, wherein said ribbon has a mass of about 0.1 to 4.0 grams and a surface area of about 30 to 55 cm².

46. The electrically resistive ribbon of claim 45, wherein said ribbon has a mass of about 0.2 to 2.0 grams and a surface area of about 35 to 45 cm².

47. The electrically resistive ribbon of claim 46, wherein said ribbon has a mass of about 1.25 grams and a surface area of about 39 cm².